

RECOMMENDED QUESTIONS

FRUITS AND VEGETABLES

Fruits and Vegetables

Not counting juice, how often do you eat fruit? (# per day, week, month, year; never)

Preliminary Rank High **Instrument** BRFSS (2003)

Administration

Population National, state, local
Subgroup Wisconsin/Medicare/women; Chicago/low-income/Hispanic/non-pregant/WIC/women; Arizona/adults/45+, Augusta, GA; Adults 30-74 in Cancer Prevention Study in MN; Low-income parents.
Sample Size(s) n=507 in WI, n=97 in Chicago, n=93 in AZ, n=193 in Augusta, GA Serdula M et al. 1993; n=201 Smith-Warner SA, et al. 1997; n=1465 Weaver M et al. 1999.
Mode Self:Paper/pencil; Interviewer:CAPI and CATI (18%).

Documented

Description

Other Languages	X	Spanish
Low-Income	X	Study population in Chicago had low incomes. Used with WIC and food stamp participants.
Low Education Level	X	Most of study population in Chicago had limited education.

Evidence

Reliability	X	Test-retest with control population at baseline and 3 months. Correlation coefficient = .57. Internal consistency alpha coefficient was .77.
Internal Validity	X	Criterion correlation coefficients: .56, .54, .35, and .58 FFQ; .66 and .33 dietary records; -.04 dietary recall; .70 diet recall and .68 FFQ.
External Validity		
Sensitive to Change		
Related to Outcome(s)		
Other	X	Cognitive testing.

Notes: The BRFSS estimates of fruits and vegetable consumption were lower than the FFQ, but similar to the food records or recalls.

Citations: Serdula M et al. 1993; Smith-Warner SA et al. 1997; Weaver M et al. 1999; CDC 2003.

Fruits and Vegetables

How often do you eat carrots? (# per day, week, month, year; never)

Preliminary Rank High **Instrument** BRFSS (2003)

Administration

Population National, state, local

Subgroup Wisconsin/Medicare/women; Chicago/low-income/Hispanic/non-pregnant/WIC/women; Arizona/adults/45+, Augusta, GA; Adults 30-74 in Cancer Prevention Study in MN; Low-income parents.

Sample Size(s) n=507 in WI, n=97 in Chicago, n=93 in AZ, n=193 in Augusta, GA Serdula M et al. 1993; n=201 Smith-Warner SA, et al. 1997; n=1465 Weaver M et al. 1999.

Mode Self:Paper/pencil; Interviewer:CAPI and CATI (18%).

Documented

Description

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|---------------------|----------|---|
| Other Languages | X | Spanish |
| Low-Income | X | Study population in Chicago had low incomes. Used with WIC and food stamp participants. |
| Low Education Level | X | Most of study population in Chicago had limited education. |

Evidence

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|-----------------------|----------|--|
| Reliability | X | Test-retest with control population at baseline and 3 months. Correlation coefficient = .49. Internal consistency alpha coefficient was .77. |
| Internal Validity | X | Criterion correlation coefficients: .40, .57, .41, and .51 FFQ; 23 and .31 dietary records; .34 dietary recall; .45 diet recall and .63 FFQ. |
| External Validity | | |
| Sensitive to Change | | |
| Related to Outcome(s) | | |
| Other | X | Cognitive testing. |

Notes: The BRFSS estimates of fruits and vegetable consumption were lower than the FFQ, but similar to the food records or recalls.

Citations: Serdula M et al. 1993; Smith-Warner SA et al. 1997; Weaver M et al. 1999; CDC 2003.

Fruits and Vegetables

How often do you eat green salad? (# per day, week, month, year; never)

Preliminary Rank High **Instrument** BRFSS (2003)

Administration

Population National, state, local

Subgroup Wisconsin/Medicare/women; Chicago/low-income/Hispanic/non-pregant/WIC/women; Arizona/adults/45+, Augusta, GA; Adults 30-74 in Cancer Prevention Study in MN; Low-income parents.

Sample Size(s) n=507 in WI, n=97 in Chicago, n=93 in AZ, n=193 in Augusta, GA Serdula M et al. 1993; n=201 Smith-Warner SA, et al. 1997; n=1465 Weaver M et al. 1999.

Mode Self:Paper/pencil; Interviewer:CAPI and CATI (18%).

Documented

Description

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|---------------------|----------|---|
| Other Languages | X | Spanish |
| Low-Income | X | Study population in Chicago had low incomes. Used with WIC and food stamp participants. |
| Low Education Level | X | Most of study population in Chicago had limited education. |

Evidence

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|-----------------------|----------|---|
| Reliability | X | Test-retest with control population at baseline and 3 months. Correlation coefficient = .66. Internal consistency alpha coefficient was .77. |
| Internal Validity | X | Criterion correlation coefficients: .55, .63, .13, and .37 FFQ; .50 and .16 dietary records; .11 dietary recall; .59 diet recall and .66 FFQ. |
| External Validity | | |
| Sensitive to Change | | |
| Related to Outcome(s) | | |
| Other | X | Cognitive testing. |

Notes: The BRFSS estimates of fruits and vegetable consumption were lower than the FFQ, but similar to the food records or recalls.

Citations: Serdula M et al. 1993; Smith-Warner SA et al. 1997; Weaver M et al. 1999; CDC 2003.

Fruits and Vegetables

During the past week did you have citrus fruit or citrus juice? (Y, N)

Preliminary Rank Ideal **Instrument** Food Behavior Checklist (1997)

Administration

Population Local

Subgroup African American and White FSP participants from 7 counties in CA. 8 California counties among women eligible for food stamps. 9 counties in California of women receiving food stamps.

Sample Size(s) n=95, n=100, n=132.

Mode Interviewer:Telephone and in-person among a group.

Documented

Description

Other Languages **X** Spanish

Low-Income **X**

Low Education Level

Evidence

Reliability **X** Test-retest correlation coefficient = .58.

Internal Validity **X** Correlation coefficient to servings of fruit from 24 hour recall = .29.
Coefficient to average of fruit =.27.

External Validity

Sensitive to Change Not significant.

Related to **X** Correlation to serum carotenoid level =.35.

Outcome(s)

Other **X** A Flesch Reading Ease score of 96 and a Flesch Kincaid score of 2.8 indicates less than fourth grade reading level.

Notes:

Citations: Murphy SP et al. 1998; Murphy SP et al. 2001; Townsend MS et al. 2003.

Fruits and Vegetables

How many servings of vegetables do you eat each day? (#)

Preliminary Rank Ideal **Instrument** Food Behavior Checklist (1997)

Administration

Population Local

Subgroup African American and White FSP participants from 7 counties in CA. 8 California counties among women eligible for food stamps. 9 counties in California of women receiving food stamps.

Sample Size(s) n=95, n=100, n=132.

Mode Interviewer:Telephone and in-person among a group.

Documented

Description

Other Languages **X** Spanish

Low-Income **X**

Low Education Level

Evidence

Reliability **X** Test-retest correlation coefficient = .58.

Internal Validity **X** Correlation coefficient to servings of vegetables from 24 hour recall = .38. Coefficient to average of vegetables = .32 and fiber = .35.

External Validity

Sensitive to Change

Related to **X** Correlation to serum carotenoid level = .33.

Outcome(s)

Other **X** A Flesch Reading Ease score of 96 and a Flesch Kincaid score of 2.8 indicates less than fourth grade reading level.

Notes:

Citations: Murphy SP et al. 1998; Murphy SP et al. 2001; Townsend MS et al. 2003.

Fruits and Vegetables

Think about how you usually do things now. Do you eat two or more servings of vegetables at your main meal? (usually/always, often, sometimes, rarely, never)

Preliminary Rank Ideal **Instrument** Food Behavior Checklist (1997)

Administration

Population Local
Subgroup African American and White FSP participants from 7 counties in CA. 8 California counties among women eligible for food stamps. 9 counties in California of women receiving food stamps.
Sample Size(s) n=95, n=100, n=132.
Mode Interviewer:Telephone and in-person among a group.

Documented **Description**

Other Languages **X** Spanish
 Low-Income **X**
 Low Education Level

Evidence

Reliability **X** Test-retest correlation coefficient = .55.
 Internal Validity **X** Correlation coefficient to servings of vegetables from 24 hour recall = .26. Coefficient to average of vegetables =.28 and fiber = .27.
 External Validity
 Sensitive to Change
 Related to **X** Correlation to serum carotenoid level =.35.
 Outcome(s)
 Other **X** A Flesch Reading Ease score of 96 and a Flesch Kincaid score of 2.8 indicates less than fourth grade reading level.

Notes:

Citations: Murphy SP et al. 1998; Murphy SP et al. 2001; Townsend MS et al. 2003.

Fruits and Vegetables

How many servings of fruit do you eat each day? (#)

Preliminary Rank Ideal **Instrument** Food Behavior Checklist (1997)

Administration

Population Local

Subgroup African American and White FSP participants from 7 counties in CA. 8 California counties among women eligible for food stamps. 9 counties in California of women receiving food stamps.

Sample Size(s) n=95, n=100, n=132.

Mode Interviewer:Telephone and in-person among a group.

Documented

Description

Other Languages **X** Spanish

Low-Income **X**

Low Education Level

Evidence

Reliability **X** Test-retest correlation coefficient = .42.

Internal Validity **X** Correlation coefficient to servings of fruit from 24 hour recall = .39.
Coefficient to average of fruit =.39 and fiber = .32.

External Validity

Sensitive to Change **X** p value = <.01

Related to **X** Correlation to serum carotenoid level =.31.

Outcome(s)

Other **X** A Flesch Reading Ease score of 96 and a Flesch Kincaid score of 2.8 indicates less than fourth grade reading level.

Notes:

Citations: Murphy SP et al. 1998; Murphy SP et al. 2001; Townsend MS et al. 2003.

Fruits and Vegetables

During the past week did you have raw vegetables? (Y, N)

Preliminary Rank High **Instrument** Food Behavior Checklist (1997)

Administration

Population Local

Subgroup African American and White FSP participants from 7 counties in CA. 8 California counties among women eligible for food stamps. 9 counties in California of women receiving food stamps.

Sample Size(s) n=95, n=100, n=132.

Mode Interviewer:Telephone and in-person among a group.

Documented

Description

Other Languages **X** Spanish

Low-Income **X**

Low Education Level

Evidence

Reliability **X** Test-retest correlation coefficient = .78.

Internal Validity **X** Correlation coefficient to cholesterol from 24 hour recall =-.23.
Coefficient to HEI =.22.

External Validity

Sensitive to Change

Related to No significant correlation to serum carotenoid level.

Outcome(s)

Other **X** A Flesch Reading Ease score of 96 and a Flesch Kincaid score of 2.8 indicates less than fourth grade reading level.

Notes:

Citations: Murphy SP et al. 1998; Murphy SP et al. 2001; Townsend MS et al. 2003.

Fruits and Vegetables

During the past week did you have cooked vegetables? (Y, N)

Preliminary Rank Medium **Instrument** Food Behavior Checklist (1997)

Administration

Population Local

Subgroup African American and White FSP participants from 7 counties in CA. 8 California counties among women eligible for food stamps. 9 counties in California of women receiving food stamps.

Sample Size(s) n=95, n=100, n=132.

Mode Interviewer:Telephone and in-person among a group.

Documented

Description

Other Languages **X** Spanish

Low-Income **X**

Low Education Level

Evidence

Reliability Control group reliability test not significant.

Internal Validity No significant correlations.

External Validity

Sensitive to Change

Related to No significant correlation to serum carotenoid level.

Outcome(s)

Other **X** A Flesch Reading Ease score of 96 and a Flesch Kincaid score of 2.8 indicates less than fourth grade reading level.

Notes:

Citations: Murphy SP et al. 1998; Murphy SP et al. 2001; Townsend MS et al. 2003.

Fruits and Vegetables

In the past month, about how often did you: Drink 100% orange juice or grapefruit juice? Drink other 100% fruit juices, not counting fruit drinks? Eat green salad (with or without other vegetables)? Eat French fries or fried potatoes? Eat baked, boiled, or mashed potatoes? (never, 1-3 times per month, 1-2 times per week, 3-4 times per week, 5-6 times per week, 1 time per day, 2 times per day, 3 times per day, 4 times per day, 5 or more times per day) About how many servings of vegetables, overall, do you eat per day or per week, not counting salad or potatoes? (number of servings per day, week, month, year) About how many servings of fruit do you eat per day or per week, not counting juices? (number of servings per day, week, month, year) (7-item set)

Preliminary Rank Ideal **Instrument** National 5 A Day Survey, local NCI 5 A Day projects (1997)

Administration

Population National, local (5 adult NCI 5 A Day projects)

Subgroup Nationally representative survey (random digit dialing, 18+ years old, oversampled African-Americans and Latinos, 17% and 15% below 130% poverty at baseline and followup), Massachusetts' TreatWell 5 A Day Program (22 community health centers, 23% Hispanic, 18% African-American, 20% had 12th grade education or less), Seattle's 5 A Day program (28 worksites with cafeterias), North Carolina's Black Churches United for Better Health (50 churches in 10 randomized counties, 72% female, 98% African American, mean age 53.8), Maryland WIC 5 A Day Promotion Program (16 WIC sites in Baltimore City and six Maryland counties, 55% African-American, 41% White, 100% female, mean age 27).

Sample Size(s) National 5 A Day survey n=2,837 baseline and n=2,602 followup, TreatWell study n=1,359 (only women's responses included in analysis n=1,096), North Carolina's Black Churches United for Better Health n=3,737 baseline and n=2,519 follow-up, Maryland WIC 5 A Day Promotion Program n=3,122, Warneke et al. study n=146.

Mode Self:Paper/pencil; Interviewer:In-person interview.

Documented

Description

Other Languages

Low-Income **X** WIC participants

Low Education Level 21.1% of baseline and 19.8% of final sample had less than a HS degree. Range of education levels in 5 A Day studies and projects with 10-30% having less than a HS degree.

Evidence

Reliability **X** Test-retest two weeks apart indicates poor reliability (corrected fruit juice r=0.40 vs r=0.67, fruit excluding juice r=0.18 vs r=0.68, fruit and fruit juice r=0.41 vs r=0.77, vegetables r=0.69 vs 0.69, total r=0.72 vs 0.70).

Internal Validity	X $r=0.52$ (95% confidence limits= 0.46 to 0.57) between screener and Willett's 61-item FFQ; $r=0.52$ between screener and 3-day food records; $r=0.77$ for fruit juice, $r=0.58$ for fruit excluding juice, $r=0.68$ for fruit and fruit juice, $r=0.34$ for vegetables, $r=0.53$ for total between screener and 31-item FFQ (Warneke et al. 2001); $r=0.33$ to 0.57 for fruit and 0.24 to 0.32 for vegetables compared to dietary recalls, 100- and 122- item FFQ, and serum carotenoids (Kristal et al. 2000); $r=0.52$ for men and 0.50 for women compared to dietary recall (underestimated intake compared to FFQ) (Thompson et al. 2000).
External Validity	
Sensitive to Change	X Fruit and vegetable intake increased in the intervention groups.
Related to Outcome(s)	X All 5 A Day sites used the same survey as a pretest and post test. Intervention effects: Arizona's 5 A Day for the Overlooked Worker Program 0.46 servings ($p<0.002$), Massachusetts' TreatWell 5 A Day Program 0.55 servings for worksite-plus-family intervention group ($p=0.05$), Seattle's 5 A Day program 0.3 serving ($p=0.06$), Black Churches United for Better Health 0.85 servings ($p<0.0001$), Maryland WIC 5 A Day Promotion Program 0.43 servings ($p=0.002$); $r=0.27$ for fruit and serum carotenoids, $r=0.15$ for vegetables and serum carotenoids, $r=0.58$ for total fruit and vegetable intake and serum carotenoids
Other	Based on the national 5 A Day surveys and other fruit and vegetable screeners (i.e. BRFSS).

Notes: Simple to administer and analyze, well suited for population level surveillance and intervention evaluation.

Citations: Havas S et al. 1994; Hunt MK et al. 1998; Sorensen G et al. 1999.

Fruits and Vegetables

Over the last month, how often did you eat tomato sauce? Include tomato sauce on pasta or macaroni, rice, pizza and other dishes. (never, 1-3 times last month, 1-2 times per week, 3-4 times per week, 1 time per day, 2 times per day, 3 times per day, 4 times per day, 5 or more times per day)

Preliminary Rank High **Instrument** NCI All-Day Screener

Administration

Population National
Subgroup RDD of adults 20-70 years old who were part of the NCI Eating at America's Table Study; Random sample of members from the Calibration Study of the NIH-AARP Diet and Health Study (50-69 years of age).
Sample Size(s) n=202 men and n=260 women from EATS; n=874 from NIH-AARP.
Mode Self:Paper/pencil.

Documented

Description

Other Languages
 Low-Income
 Low Education Level 79% had received more than a HS degree in Thompson FE et al. 2002b.

Evidence

Reliability
 Internal Validity **X** r=0.66 for men and 0.51 for women between complete All Day screener and four nonconsecutive 24-hour recalls; r=0.54 for men and 0.59 for women for All Day screener compared to dietary recall (underestimated intake compared to FFQ).
 External Validity
 Sensitive to Change
 Related to
 Outcome(s)
 Other **X** Cognitive, think-aloud interviews with 30 men and women.

Notes:

Citations: Thompson FE et al. 2002a; Thompson FE et al. 2002b.

Fruits and Vegetables

During the past 12 months, how often per day, per week, per month or per year did you eat dark green vegetables, such as the food listed on this card? (# OF TIMES PER DAY, WEEK, MONTH OR YEAR; NEVER IN THE PAST 12 MONTHS) (See notes)

Preliminary Rank High **Instrument** NHANES Diet Behavior and Nutrition Sample Person Questionnaire 2001-2002

Administration

Population National
Subgroup Nationally representative; Question for 60+ years of age only; Survey oversamples older persons (60 years and over), African Americans, Mexican Americans, low income persons (less than 130 percent of poverty), and adolescents 12-19 years old.
Sample Size(s) n=approximately 7,000 interviewed annually (all ages).
Mode Interviewer:In-person interview; trained interviewer using CAPI; individual setting at respondent's home.

Documented

Description

Other Languages **X** Spanish
 Low-Income **X**
 Low Education Level

Evidence

Reliability **X** Some items underwent reliability testing.
 Internal Validity
 External Validity
 Sensitive to Change
 Related to
 Outcome(s)
 Other **X** New questions were added or modified based on recommendations from survey collaborators, NCHS staff, and other interagency work groups, and through large-scale field testing of English-Spanish speaking participants.

Notes: The following examples of dark green vegetables are given to the respondent on the DBQ1 hand card: broccoli; spinach; romaine and other dark green lettuce; turnip, beet and mustard greens; collards; kale; chard.

Citations: NCHS/NHANES 2004; An C et al. 2003.